

# REPORT DOCUMENTATION PAGE

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MEMORANDUM FOR PRS (In-House Contractor Publication)

FROM: PROI (STINFO)

17 Dec 2001

SUBJECT: Authorization for Release of Technical Information, Control Number: **AFRL-PR-ED-AB-2001-242**  
Rusty Blanski; Justin Leland (ERC); Brent Viers; Shawn Phillips "High Temperature Lubricants Based  
on Polyhedral Oligomeric Silsesquioxanes (POSS)" *ABSTRACT ONLY*

**SAMPE Industry Conference**  
(12-15 May 2002) **(Deadline: 31 Jan 2002)**

(Statement A)

1. This request has been reviewed by the Foreign Disclosure Office for: a.) appropriateness of distribution statement, b.) military/national critical technology, c.) export controls or distribution restrictions, d.) appropriateness for release to a foreign nation, and e.) technical sensitivity and/or economic sensitivity.

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Signature \_\_\_\_\_ Date \_\_\_\_\_

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Comments: \_\_\_\_\_  
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APPROVED/APPROVED AS AMENDED/DISAPPROVED

\_\_\_\_\_  
PHILIP A. KESSEL Date  
Technical Advisor  
Space and Missile Propulsion Division

## High Temperature Lubricants Based on Polyhedral Oligomeric Silsesquioxanes (POSS)

Rusty Blanski, Justin Leland, Brent Viers and Shawn H. Phillips

Lubricants that operate at high temperature can be useful for high performance jet turbines. The challenges that have to be overcome for high performance turbines are two fold. The first challenge is increasing the operating temperature of the system while the second challenge is maintaining low temperature pumpability. We have been investigating the use of POSS compounds for lubrication applications because of its proven high temperature stability and its access to a diverse array of silsesquioxane geometries that may be amenable to low temperature pumpability. Consequently, a wide array of POSS alkyls were synthesized and tested for temperature stability and viscosity profiles. The synthesis of these POSS alkyls as well as the relevant temperature and viscosity data will be discussed.

**DISTRIBUTION STATEMENT A**  
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